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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,620	04/18/2001	Donghao Chen	2685.2016-000	8051

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EXAMINER	
GOLLAMUDI, SHARMILA S	
ART UNIT	**PAPER NUMBER**
1616	

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/837,620	CHEN ET AL.	
	Examiner	Art Unit	
	Sharmila S. Gollamudi	1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt of Request for Continued Examination received on December 8, 2004. Claims 1-28 stand cancelled. Claims **29-52** pending in this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 29-31, 34-37,40-41, 43-44, 47-50 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 97/39747.

WO discloses spray drying pharmaceutical compositions using a drying gas (air) with a dew point of less than 0 degrees Celsius. See page 6, lines 1-2. The inlet temperature is 40-120 degrees Celsius and the outlet temperature is 5-35 degrees Celsius. See page 11, lines 15-17. The process involves spraying a stream of air into an atomized suspension so that the solvent evaporates. The product is then collected in a cyclone. WO teaches the drying gas exhibiting a low dew point aids in the production of a substantially continuous coating. Further, the reference teaches controlling the process parameters including temperature, solvent concentration, spray drier capacity, atomizing air pressure, droplet size, and total air pressure in the system allows for a range of coats from dense, continuous, and non-porous. Note pages 10-12. Example 1 discloses ethylcellulose dissolved in methylene chloride and paracetamol dispersed in the solution for the liquid feed.

*Note it is the examiner's position that WO's tap density would be that of the instant invention's since WO teaches instant dew point and applicant claims that this dew point provides for instant particle properties.

Response to Arguments

Applicant argues that WO does not disclose selecting a dew point of a drying gas to correspond to the formation of spray-dried particles having a targeted aerodynamic properties suitable for inhalation. Applicant argues that WO teaches the selection of the dew point aids in the formation of a continuous coating. It is argued that WO does not disclose or suggest controlling specific parameters such as moisture content of the drying gas has an effect on the aerodynamic properties of the particles. Secondly, applicant argues that WO discloses particles too big for pulmonary delivery and the inventions' diameter is 1 to 3 microns.

Applicant's arguments have been fully considered but they are not persuasive. Firstly, it is pointed out that "suitable for inhalation" is given weight in terms that it is non-toxic, which renders it suitable and thus reads on instant invention. Secondly, the examiner points out that the rejected claims do not recite the instant diameter and merely claim "a targeted aerodynamic diameter and targeted tap density." Therefore, since the claims do not recite specific parameters, the prior art reads on the rejected claims since WO's particles inherently have an aerodynamic diameter and tap density. WO discloses a preferable median range of 100 microns and thus they have "targeted" ranges. Furthermore, WO discloses selecting parameters including a certain dew point, outlet temperature, and inlet temperature, to yield the targeted particle.

Lastly, in response to applicant's argument that the selection of the dew point of the drying gas yields a certain aerodynamic properties, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In instant case, the prior art clearly discloses selecting instant dew point to provide for certain characteristics. Furthermore, the art discloses instant inlet and outlet temperature. The fact that applicant has found that the same dew point and parameters provide for another characteristic inherently possessed by the prior art does not impart patentability to the instant claims.

Claims 29-37 and 40-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Edwards et al (5,985,309).

Edwards et al disclose preparation of particles for inhalation with a specified tap density, geometric diameter, and median diameter. See abstract. Edwards discloses the method of spray drying insulin, which is combined with lactose and DPCC, and ethanol. The solution is spray dried with an inlet temperature of 110 degrees Celsius, an outlet temperature of 61 degrees Celsius, and an atomization pressure of 42.72 psi. Edward discloses a feed rate of 40 ml/min. The tap density is 0.05 and the aerodynamic diameter is 1.5 microns. (Note examples, especially 7 and 9). Edwards discloses that the inlet and outlet temperature among other factors increases porosity and surface roughness (example 2) and features that contribute to low tap density are irregular surface texture and porous structure. See column 10, line 67 to column 11, line 2. In

example 2, Edwards discloses that larger particle sizes can be achieved by lowering the inlet compressed air flow rate. Edwards discloses that by varying the composition of the spray dried material and the spray drying parameters, the aerodynamic properties (density and size of the particles) can be controlled. See column 27, lines 12-31.

*It is the examiner's position that it is implicit that the prior art has "selected a dew point" since the selection of the air velocity and the inlet air temperature are dependent on the batch size, the dew point of the air, and spray rate. Thus, since Edwards discloses the feed rate, the air velocity, inlet temperature, and batch size, the selection of the dew point is an implicit step because all these parameters are correlating factors and selection of one factor is dependent on the other factors.

Further, the limitation of 31 is inherent since Edward discloses the instant aerodynamic properties and inlet/outlet temperatures and applicant states that the instant dew point yields the instant aerodynamic properties.

Claims 29-30 and 32-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeffrey Mintzes (Spray Drying of Large porous Particles For Aerosol Drug Delivery To The Lung).

Mintzes discloses a method of spray drying particles with mean diameters less than 5 microns for inhalation. See page 6. The reference discloses that large, porous particles of the right density and size have the ability to deposit deep in the lungs. See page 8. The spray solution preparation contains lactose, albumin, DPPC, ethanol, and water. See page 9. Mintzes discloses instant spray drying conditions. The compressed air has a relative humidity of 1-5% with a variable pressure of 2000-30,0000 rpm. The

feed rate is 20-66 ml/min with an inlet temperature of 100, 110, 150, or 200 degrees Celsius. The outlet temperature is between 50 to 130 degrees Celsius. A container is attached to the cyclone to collect the product. See page 10. The reference discloses that the particles attained from the spray drying process depend on many variables including flow rate, inlet temperature of the gas drying feed, the solution feed rate, and atomizer rate. See page 13. The reference discloses that the inlet temperature of the drying gas has the strongest effect on tap density and a temperature of 110 degrees Celsius yield a tap density of 0.06 g/cc and 150 yields 0.24 g/cc. See page 19-20. See page 23-24.

*Note that relative humidity is the water vapor content of the air relative to its content at saturation and dew point is the temperature of the air at which vapor present in the air would cause saturation. Hence, the meaning of dew point is an indirect measure of humidity. Hence, to select the humidity of the drying gas is indirectly selecting the dew point of the gas.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 38-39 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edwards et al (5985309) by itself or in view of WO 01/23821.

Edwards et al disclose preparation of particles for inhalation with a specified tap density, geometric diameter, and median diameter. See abstract. Edwards discloses the method of spray drying insulin, which is combined with lactose and DPCC, and ethanol. The solution is spray dried with an inlet temperature of 110 degrees Celsius, an outlet temperature of 61 degrees Celsius, and an atomization pressure of 42.72 psi. Edward discloses a feed rate of 40 ml/min. The tap density is 0.05 and the aerodynamic diameter is 1.5 microns. (Note examples, especially 7 and 9). Edwards discloses that the inlet and outlet temperature among other factors increases porosity and surface roughness (example 2) and features that contribute to low tap density are irregular surface texture and porous structure. See column 10, line 67 to column 11, line 2. In example 2, Edwards discloses that larger particle sizes can be achieved by lowering the inlet compressed air flow rate. Edwards discloses that by varying the composition of the spray dried material and the spray drying parameters, the aerodynamic properties (density and size of the particles) can be controlled. See column 27, lines 12-31.

Edwards does not specify separating the waste drying gas or the collection of the particles. Further, a system of maintaining the condition of the drying gas is not specified.

WO 01/23821 teaches a method and system of controlling evaporative drying processes. WO states that it is a tedious process to control and ensure the optimal parameters are maintained. See page 1-2/ WO teaches a system that continuously monitors the parameters associated with evaporative drying processes which is fed to a controller. See page 5. The reference teaches the parameters such as drying gas temperature, dew point, drying gas flow rate (inlet and outlet temperature), and spray rate influence the type of final product. Further, WO teaches the control process parameters provide for a specified product quality (abstract). WO discloses that spray drying consists of four stages: atomizing the feed, spray-gas contact, drying, and separation of the dried product from the drying gas (pg. 16). WO discloses varying certain parameters such as feed rate, drying gas temperature, etc. provides for different particle sizes. See page 16-17.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Edwards et al and WO and separate the drying gas and utilize a system that maintains the parameters of a drying process. One would be motivated to do so since WO teaches an efficient and inexpensive system of controlling and monitoring the parameters associated with drying processes such as spray drying. Further, since these parameters affect the final product, WO teaches the criticality of monitoring the parameters. Lastly, WO teaches the conventional steps associated with spray drying such as separating the drying gas from the particles and collecting the product. Therefore, the separation and collection is

deemed to obvious to a skilled artisan since WO demonstrates these are routine steps in the process of spray drying particles known in the art.

Conclusion

All claims are rejected at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharmila S. Gollamudi whose telephone number is 571-242-0614. The examiner can normally be reached on M-F (8:00-5:00) with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SSG

March 23, 2004

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